

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Canceled)
2. (Currently amended) A process for producing hydrazine with nitrogen and hydrogen as raw materials, and comprising the steps of:
 - (A) generating ~~a large quantity of~~ photons from a high-energy laser pulsed source, with pulse energy at least 10^5 J per pulse;
 - (B) passing said photons through a laser amplifier pumped by an arc lamp to produce photons with increased pulsed intensity, with pulse intensities ~~between~~ at least 10^{11} W/cm² ~~and~~ 10^{12} W/cm²;
 - (C) introducing said intensified pulsed laser photons to excite nitrogen molecules from said nitrogen raw materials through two-photon absorptions so that said nitrogen molecules are induced to make transitions from ~~the~~ a ground vibrational state thereof to excited vibrational states ~~in the ground electronic configuration;~~
 - (D) flowing said excited nitrogen molecules ~~after said laser pulse excitation~~ to a high-pressure vessel so as to cause effective collisional-mixing leading to a new vibrational energy state;
 - (E) flowing said nitrogen molecules at said new vibrational energy state from said high-pressure vessel to a container containing hydrogen from said hydrogen raw materials which reacts with said new vibrationally excited nitrogen molecules to form hydrazine; and

(F) cooling said hydrazine and leading to a liquid form of output.

3. (Currently amended) The process of claim 2 wherein said high-energy laser pulsed source has the photon wavelengths are from the longest visible red to near infrared wavelengths between 0.76 μm and 1 μm .

4. (Currently amended) The process of claim 3 wherein said high-energy laser pulsed source includes ~~said photons used are near-infrared laser photons produced from a Nd: YAG laser.~~

5. (Currently amended) The process of claim 2 wherein said high-energy laser pulsed source has ~~a the photons come from a short-pulse laser source, with pulse length between at least~~ 0.1 nanoseconds and 1 nanoseconds.

6. (Currently amended) The process of claim 2 wherein said arc lamp includes ~~the desired photon intensity between 10^{11} W/cm² and 10^{12} W/cm² comes from a laser amplifier pumped by flashlamps a flashlamp.~~

7. (Original) The process of claim 6 wherein said flashlamp is a cesium-neon arc lamp.

8. (Canceled)

9. (Currently amended) The process of claim 2 wherein the molecule ratio of said hydrogen to and said nitrogen is have a molecular ratio of 2:1.

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10. (Currently amended) The process of claim 2 wherein ~~the method of~~ cooling is conducted with a cyclic water flow system equipped with a heat exchanger.

11. (Currently amended) The process of claim 2 wherein said hydrazine is cooled to ~~ordinary a~~ temperature no higher than 300°K and ~~pressure, but not higher than 150°C.~~

12. (Currently amended) A process for producing hydrazine with nitrogen and water as raw materials, ~~and~~ comprising the steps of:

- (A) generating ~~a quantity of~~ photons from a high-energy laser-pulsed source, with pulse energy at least 10^5 J per pulse;
- (B) producing photons with increased pulse intensity after traversing a laser amplifier pumped by an arc lamp, with pulse intensities ~~between~~ at least 10^{11} W/cm² and 10^{12} W/cm²;
- (C) introducing said intensified pulsed laser photons to excite nitrogen molecules from said nitrogen raw materials through a two-photon absorption process so that said nitrogen molecules are induced to make transitions from ~~the a~~ ground vibrational state thereof to excited vibrational states ~~in the ground electronic configuration;~~
- (D) flowing said nitrogen, after said laser pulse excitation to produce excited nitrogen, into a vessel containing water so as to have good mixing between said excited nitrogen and said water; and
- (E) providing an outlet so that ~~the~~ gas molecules consisting of ~~the ground states of~~ O₂ and N₂ can bubble out.

13. (Currently amended) The process of claim 12 wherein ~~the photons used are~~ said high-energy laser-pulsed source includes a XeCl excimer laser photons of wavelength $0.35\mu\text{m}$.

14. (Currently amended) The process of claim 12 wherein the photons used are in ~~the~~ shortest visible blue with wavelength of 0.4 μ m.

15. (Original) The process of claim 12 wherein the photons used have wavelengths between 0.35 μ m and 0.4 μ m.

16. (Currently amended) The process of claim 12 wherein the photons ~~come from a short pulse laser source, having have a pulse length between at least~~ 0.1 nanoseconds and 1 nanosecond.

17. (Currently amended) The process of claim 12 wherein said increased photon intensity between 10^{11} W/cm² and 10^{12} W/cm² comes from a laser amplifier pumped by arc lamp includes flashlamps a flashlamp.

18. (Original) The process of claim 17 wherein said flashlamp is a lithium-argon arc lamp.

19. (Canceled)

20. (Currently amended) The process of claim 12 wherein ~~the molecular ratio of~~ said water molecules ~~to~~ and said nitrogen molecules ~~is~~ have a molecular ratio of at least 2:1.

21. (Original) The process of claim 12 wherein said outlet comprises a cyclic water-flow system equipped with a heat exchanger utilizing water operating at room temperature.